

NATIONAL ACADEMY OF SCIENCES

2101 CONSTITUTION AVENUE
WASHINGTON, D. C. 20418

STATINTL

November 14, 1975

Dr. V. A. Filippov
Head, Science Organization Department
Academy of Sciences of the U.S.S.R.
Leninskiy Prospekt, 1y
Moscow, U.S.S.R.

Dear Dr. Filippov:

Your letter of last September was most welcome. We are pleased and impressed with the steps being taken by the USSR Academy of Sciences in fulfilling our common program of cooperation. Your progress in organizing studies with the direct participation of Academicians and other experts is most reassuring from the standpoint of achieving meaningful mutual understanding of our national systems for fundamental research.

I am taking this opportunity to comment on several of the component studies with a view to facilitating common approaches and useful comparisons.

1. Surveys Characterizing National Systems of Stimulating the Development of Fundamental Research

The U.S. side is proceeding generally along the lines of the agreed Survey outlines. In addition, we are undertaking in-depth studies of a number of important issues to provide detailed understanding of the actual workings of the U.S. fundamental research system to a degree that would not be feasible for all of the elements in the general outline. The issues we hope to cover include:

- a) the consequences and implications of the pattern of government funding of fundamental research;
- b) the philosophy and operation of the "peer review" system for evaluating proposals for support of fundamental research, its strengths and weaknesses;
- c) the determination of priorities within and among fields of fundamental research;
- d) the interactions of fundamental and applied research, and the transfer of fundamental research to application;

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- e) analysis of alternative methods and organizational arrangements for the support of fundamental research;
- f) the role of the scientific community in policies and decisions for fundamental research;
- g) the allocation of resources among new and existing centers for fundamental research;
- h) indicators for measuring or assessing the results of fundamental research.

We would appreciate knowing whether your survey group would be willing to follow a similar approach and, if so, the topics that you will select for in-depth analysis.

2. Case Studies Analyzing Decision-making Processes in the Area of Fundamental Research

Comparative Analysis of Competing Organizations

In describing the status of the case studies, no mention was made in your letter of the agreed study of "the selection process in the allocation of resources among scientific institutions engaged in the same field of research." The U.S. side has initiated the corresponding study of the procedures for the allocation of resources among research centers for materials sciences, as outlined in my letter to you of 14 February 1975. However, we will not undertake further work on this study pending confirmation of your intention to proceed with the corresponding case study.

Retrospective Analysis of the State of Fundamental Research

We have read with considerable interest the 1957 Kapitsa Forecast for Low-temperature Physics. I hope to send you in the near future, for comment, a preliminary draft of our report in this area. This is a comparative study of two reports by the National Academy of Sciences in the field of physics. It was prepared by Dr. William Lowrance under the guidance of a scientific review committee and has benefitted from the comments and criticisms of a number of Academicians and other outstanding scientists. This case study is at a stage where we are prepared to invite representatives of your side to meet with Dr. Lowrance and the members of the National Academy review group. To this end, I would like to invite Academician Mel'nikov and Professors Airuni and Etinger to visit the United States next February to discuss the two related case studies. We plan to arrange to hold a small seminar on the subject and site visits as requested. Alternatively, we would be pleased to send a small delegation to the USSR for discussions of these retrospective analyses.

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Joint Scientific Assessment

In my letter to Dr. Zhavoronkov of 28 July 1975, I reviewed the developments since my letter to you of 17 December 1974 concerning this component of our joint work program. In essence, this will take the form of a joint scientific assessment of the problems of arid land agriculture in the US and the USSR, including climatic aspects, as described in the enclosed letter from the Foreign Secretary of the National Academy of Sciences to Dr. G. K. Skryabin, dated 3 October 1975. The planning for this joint assessment is progressing with the convening of a joint working group in the USSR 14 - 19 December to prepare a detailed study plan. I assume that you have been consulted, and that you agree that the proposed study will serve the objectives set forth in our joint study plan of September 1974.

Other Case Studies

The study of the decision to construct a large radiotelescope, the VLA, has progressed through the fact-finding stage. Dr. George Swenson is preparing the first draft of the study report.

As regards organizational mechanisms for initiating new fundamental research projects, we are at an early phase of an examination of an ecosystems integrated research program. At present, we do not contemplate the conduct of other "ministudies" unless there are specific areas you wish us to explore from the standpoint of new initiatives in fundamental research.

The study of the Brookhaven National Laboratory is well underway, and we anticipate having a first draft in the next several months.

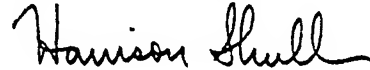
A final draft of the case study on screwworm eradication has been completed. This study illustrates the utilization of results of fundamental research in solving applied problems.

As the Survey and case studies are now in various states of completion, it is timely to consider an exchange of visits (of two to three weeks duration) by representatives of the various study groups. I propose that these visits be arranged as soon as feasible and suggest that they be arranged directly between the representatives of the corresponding study groups. On the U.S. side, these will be the principal authors of the study reports, possibly accompanied by one or two members of the responsible review committee. I am attaching a list of the names and affiliations of these authors and would appreciate receiving a list of your representatives and the earliest dates when they will be in a position to receive the corresponding U.S. representatives. As previously agreed, we are proceeding on the principle that the receiving side will assume the "in country" costs.

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I am addressing this letter to you in the expectation that you will discuss these various points with Academician Zhavoronkov. Considering the increased pace of our joint work and the tight schedule, I sincerely hope that we can be in more frequent communication and that I will hear from you in the very near future.

Most sincerely,

A handwritten signature in cursive script, appearing to read "Harrison Shull".

Harrison Shull

Studies of the U.S. System
for Fundamental Research

I. Surveys Characterizing National Systems of Stimulating the Development of Fundamental Research

Author: Dr. Thane Gustafson
Seminar on Science, Technology and Public Policy
John F. Kennedy School of Government
Harvard University

with Professors Harvey Brooks and Don Price,
Harvard University

II. Case Studies Containing Retrospective Analyses of Decision-Making Processes in the Area of Fundamental Research

1. A study of the decision to construct a large radiotelescope, the VLA

Author: Professor George Swenson
Department of Astronomy
University of Illinois

with Dr. David Heesch, Director
National Radio Astronomy Observatory

2. An ecosystems integrated research program

Author: Professor Robert Hoffman
Department of Systematics & Ecology
University of Kansas

3. A study of Brookhaven National Laboratory

Author: Dr. Leland Haworth (former Director, Brookhaven Natl. Lab.)
Brookhaven National Laboratory
Associated Universities, Inc.

4. Screwworm eradication

Author: Dr. R. C. Bushland, Xanthisma, Texas

with Dr. E. F. Knipling, U.S. Department of Agriculture

5. A comparative study of two reports by the National Academy of Sciences in the field of physics

Author: Dr. William Lowrance
Program for Science and International Affairs
Harvard University

in consultation with Dr. Allan Bromley, Yale University; Dr. Raymond Bowers, Cornell Univ.; Dr. Franklin Long, Cornell Univ.; Dr. George Pake, Xerox Corp.

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Studies of the U.S. System
for Fundamental Research

6. Allocation of resources among research centers for materials
sciences (proposed study)

Author: Dr. Alan Chynoweth
Bell Laboratories

in consultation with:

Dr. Bruce Hannay
Bell Laboratories

H. Etzel
National Science Foundation

R. Huggins
Stanford University

R. Sproull
University of Rochester

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NATIONAL ACADEMY OF SCIENCES

OFFICE OF THE FOREIGN SECRETARY
2101 CONSTITUTION AVENUE
WASHINGTON, D.C. 20418

October 3, 1975

Dr. G. K. Skryabin
Acting Chief Scientific Secretary
Academy of Sciences of the USSR
Leninskiy Prospekt, 14
Moscow, USSR

Dear Dr. Skryabin:

In accordance with our exchange of Telex messages last April and following on my July 14 letter to you, I am pleased to announce that planning has been begun on the US side for the long-delayed joint US-USSR project in arid lands agriculture. I have also received a copy of Professor Thomas Malone's September 20 letter to you reporting on his conversations at the Vienna ICSU meeting with Corresponding Member Viktor Kovda, and I believe that you have already been informed about the substance of our current planning for this interesting project.

In my earlier letter I suggested that we combine into one joint scientific assessment project the arid lands symposium, which we have discussed previously, and a project on weather forecasting and monitoring of climatic change. However, as my colleagues and I examined this suggestion in greater detail we came to feel that it would be impossible to accord equal weight to these two quite different topics within a single joint undertaking. The solution proposed was to return to the idea of holding a meeting to assess the problems of arid lands agriculture in the US and USSR, including as one of several important topics for consideration the problem of weather forecasting and climatology in arid areas. Rather than a joint symposium of the traditional type, however, we now propose an in-depth scientific assessment as called for in the Science Policy Project of the US-USSR Agreement on Scientific and Technical Cooperation. The product would be a jointly-prepared report on the state-of-the art in arid lands research and the implications for the two governments' activities. Areas could be identified in which further scientific investigation seems advisory, including possible topics for US-Soviet collaboration in research.

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We propose five major subjects for consideration under the project: Land Use; Hydrology; Metrology and Climatology; Crop and Farm Managements Sciences; and Range and Animal Management Sciences. Enclosed is a detailed list of proposed topics for discussion within each area, together with a listing of the scientific disciplines which we feel should be represented by participants in each working subgroup.

We believe it would be desirable to organize the work of the joint scientific assessment project along the following lines. An initial meeting of the two organizing committees would be held in Washington, D.C., either the first week of December or the last week in November of this year. The organizing committees, led by the project co-chairmen, would consist of the five working group leaders from each side who represent the five topics suggested above. Group leaders should be well-known scientists with considerable practical experience in their disciplines who have shown a broad appreciation of major scientific problems. It would be the task of the joint organizing committee meeting to identify the key areas to be studied, to suggest appropriate and comparable experts in both countries to comprise the working groups (perhaps 6-10 persons from each country, especially emphasizing the youthful, highly-productive specialists), and to devise a detailed outline for a final plenary meeting. After several months devoted to preparation of studies in each country by scientists from each working group, and intensive international correspondence and exchange of printed materials among the various scientists, a plenary meeting would be held, possibly at a site in the USSR. This plenum would comprise perhaps 35 or more delegates from each side. In nature it would be a large working meeting with a number of working subgroups which would be expected to produce a final joint report and recommendations.

We anticipate that the Washington organizational meetings can be expected to occupy three or four days, following which the Soviet delegation would be invited to tour some of the laboratories and field sites where active research in arid lands problems is being conducted. Our Academy would be prepared to meet all necessary expenses within the United States for a six-member delegation from your Academy for a period of approximately ten days.

It is my understanding that Professors Malone and Kovda have discussed these proposals at some length and that both sides

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recognize the need now to proceed swiftly. We would welcome your Academy's views of our proposal as well as the names of members of the organizing committee at an early date in order that there should be no further delays in realizing this worthwhile joint study.

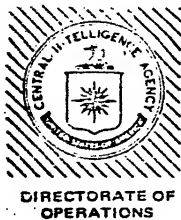
Please accept my best regards.

Sincerely yours,

George S. Hammond
Foreign Secretary

Enclosure

DOMESTIC COLLECTION DIVISION



Intelligence Information Report

 NATIONAL SECURITY INFORMATION
 Unauthorized Disclosure Subject to Criminal Sanctions

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 Appraisal of V A Kirillin, Deputy
 Chairman of USSR Council of Ministers

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[This report was developed by an Army representative who is assigned to the office of preparation.]

[Available in Central Libraries Division, Document Services Branch, is a seven page statement by V A Kirillin, Deputy Chairman of the USSR Council of Ministers and Chairman of the State Committee of the USSR Council of Ministers for Science and Technology. The statement was made at a meeting with members of a delegation of the US House of Representatives on 11 August 1975. It is considered an important statement as to Soviet views on the utility of Joint US/USSR activities in the area of science and technology.]

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(Statement by Academician V.A. KIRILLOV, Deputy Chairman of the USSR Council of Ministers and Chairman of the State Committee of the USSR Council of Ministers for Science and Technology, at a meeting with members of the Delegation of the US House of Representatives held on August 11, 1975)

In the present conditions scientific and technical cooperation is becoming a major constituent of interstate relations.

The Soviet Union bases itself on the fact that scientific and technical cooperation is mutually beneficial. In our view there is no country, and neither there can be, which would hold the leading position in all major areas of science and technology.

As experience has demonstrated the cooperation in the field of science and technology presents a solid basis for the development of trade and cooperation in economy.

In the past years scientific and technical cooperation between the Soviet Union and the United States of America has made a good progress. The reason for this is, first and foremost, an ease in the international situation and the improvement of the Soviet-American relations.

Of particular importance are regular summit meetings.

There is no doubt that the Conference on Security and Cooperation in Europe held recently in Helsinki and the signing of the Final Act would largely promote a favourable development of international relations as well as international scientific and technical cooperation.

In the Helsinki Final Act there is a special paragraph on scientific and technical cooperation. It is worth to remind that all 14 fields of science and technology mentioned in the Final Act are under scope of USSR-USA cooperation.

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What are the latest developments in the Soviet-American scientific and technical cooperation?

As was indicated before during recent years our cooperation in science and technology acquired a significant momentum.

In 1972-1974 there were signed 11 intergovernmental agreements that cover the following fields of science and technology

1. In the field of science and technology in general.

It should be noted that this October the regular 3rd session of the Joint Commission on Science and Technology will take place here in Moscow. This commission concentrates its attention on several key fields of science and technology and besides it makes coordination work in all spheres of scientific and technical cooperation.

2. Environmental Protection.
3. Medical Science and Public Health
4. Exploration and Use of Space
5. Agriculture
6. Transportation
7. World Ocean Studies
8. Peaceful Uses of Atomic Energy
9. Housing and Other Construction
10. Energy
11. Creation of Artificial Heart

It is quite evident that very important directions have been selected for scientific and technical cooperation. Within the framework of all above-mentioned agreements corresponding bilateral commissions have been set up and

work in this sphere is vested in the Joint Committee For Health
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Cooperation).

Apart from cooperation through intergovernmental channels there is cooperation which has been developing between Soviet industrial ministries and research organizations, on the one hand and the American companies interested in such cooperation, on the other. At present the State Committee of the USSR Council of Ministers for Science and Technology has signed long-term agreements on scientific and technical cooperation with forty-three US firms. (The list of the US Companies who are signatories to the agreements on scientific and technical cooperation is enclosed herewith).

To a certain extent one could see the scale of cooperation from the figures of the exchange of scientists and technical specialists:

- In 1974 some 3200 scientists and specialists from the USA came to the Soviet Union in connection with the questions related to cooperation in science and technology;

- That same year about 1600 scientists and specialists from the USSR went to visit the USA.

The buy-and-sell of licenses has been gradually developing. For the last 7 years (1968-1975) speaking of licenses alone:

The United States has bought 21 licenses from the Soviet Union;

The Soviet Union has bought 17 licenses from the United States;

Of course it is not very much and the work in this field should be further developed.

What is specifically being done in the field of scientific-technical cooperation between the Soviet Union and the United

States of America?

1. There is a considerable growth of the number of seminars and exchange of scientists. It is necessary to note that this form of cooperation was called an important one in the Final Act signed in Helsinki. Let us take only two examples:

- within the framework of the activity of the working group on microbiological synthesis (The Commission on scientific-technical cooperation) a seminar was held in April 1975 at the chemical division of the Moscow State University on the following subject: "Modern achievements in the production and utilization of the immobilized enzymes". The Soviet and American specialists representing industry, scientific centers and universities took part in this seminar. As a result of these fruitful discussions the participants of the seminar received important data clarifying the modern state of research in this field and made the appraisal of the prospect of the development of Soviet-American cooperation in the field of engineering enzymology.

- the working group on chemical catalysis of the Joint Commission on Science and Technology successfully arranges the exchange of trainees. A dozen American scientists got training in the Soviet institutions, 6 Soviets got much longer training in the USA.

Both above-mentioned forms of cooperation - joint seminars and exchange of trainees - deserve to be developed further in future.

2. The exchange of scientific and technical information is expanding. This direction of cooperation in the field of science and technology is also mentioned in the Final Act. Examples of mutual beneficial exchange of scientific and technical information could be cited specifically in the field of transportation:

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organization of high speed (up to 200 km/h) railroad passenger traffic on the existing lines:

- in the field of modern designs of railroad tracks and other items;
- on tunnel and bridge construction;
- on highway safety.

The cooperation in the field of scientific and technical information should be further developed.

3. We can probably say that the highest form of scientific and technical cooperation is the carrying out of joint projects. This form of cooperation is under expansion. The concrete examples could be given:

- in the field of electrometallurgy a program of joint research is under realization. It includes plasma-arc melting of metallic materials, electroslag technology, electron-beam evaporation of materials etc.

It is worthwhile mentioning that among the participants there are industrial organizations of the USSR and the USA:

- in the field of Marine Transport there is a joint study of ocean-wave spectra of tensions in ships body elements. The parties have started the realization of a joint program on ice-transiting vessels. There is also an exchange of trainees in this field.

- interesting joint research is carried on in the field of World Ocean studies. The USSR and the USA are the largest contributors into the Tropical experiment which got realized in 1974 and gave practical results on ocean-air interaction that are important for weather prognosis. New interesting data have been received from deep-sea drilling project with the use of American ship "Glomar Challenger" where Soviet scientists participated.

- the Agreement on cooperation in medical science and public health is under implementation and includes the problems of heart diseases, cancer, influenza and other virus diseases. For example, the exchange with anti-tumour medicines and instruments has been carried out;
- the joint experiment in the field of environment protection with the aim to study the effect of different pollutants on the upper atmosphere strata has been carried out on the board of the Soviet laboratory-airplane "IL-18" using the Soviet and American instruments installed on the radio-probes. At the present time two joint Soviet-American expeditions have been working on the Soviet ships "Moscow University" and "Valerian Uryvaev" to study the effect of pollutants on marine organisms;
- in the field of power industry the research has been carrying out on the MHD method of direct transformation of thermal power into electric power. The joint studies of magnetic systems, channel design, new heat resistive and electrode materials have been carried out based on the Soviet pilot plants. The Soviet and American participants of these studies consider that the establishment of power stations with MHD generators will have a great importance in future, because they allow to save 25-40% of fuel as compared with thermal power stations;
- somehow apart, but of great importance, are joint programs related to problems of planning and financing of scientific research, training of scientific workers, planning of science.

It would be quite easily to cite other numerous examples of jointly conducted works. This is a very important form of cooperation in science and technology and it is necessary to develop it further.

ration and utilization of the outerspace for peaceful purposes - the joint flight of spaceships "Soyuz" and "Apollo". A lot is said and written about this outstanding event of Soviet-American cooperation in science and technology. It is necessary to develop this area of cooperation in science and technology in the future.

What are the results of Soviet-American cooperation in science and technology and how to evaluate them?

One can say that a lot is done and essential results are achieved. Scientists and specialists of the USSR and USA have become better acquainted with each other. However it is only the beginning. Reserves of USSR and USA in the field of science and technology development are very large and one has to strive for such state of cooperation in science and technology which would be adequate to these reserves. It will be in the interests of our both nations, in the interests of friendship and peace in the World.